# The Economic Impact of Houston's Smoking Ordinance

Prepared by
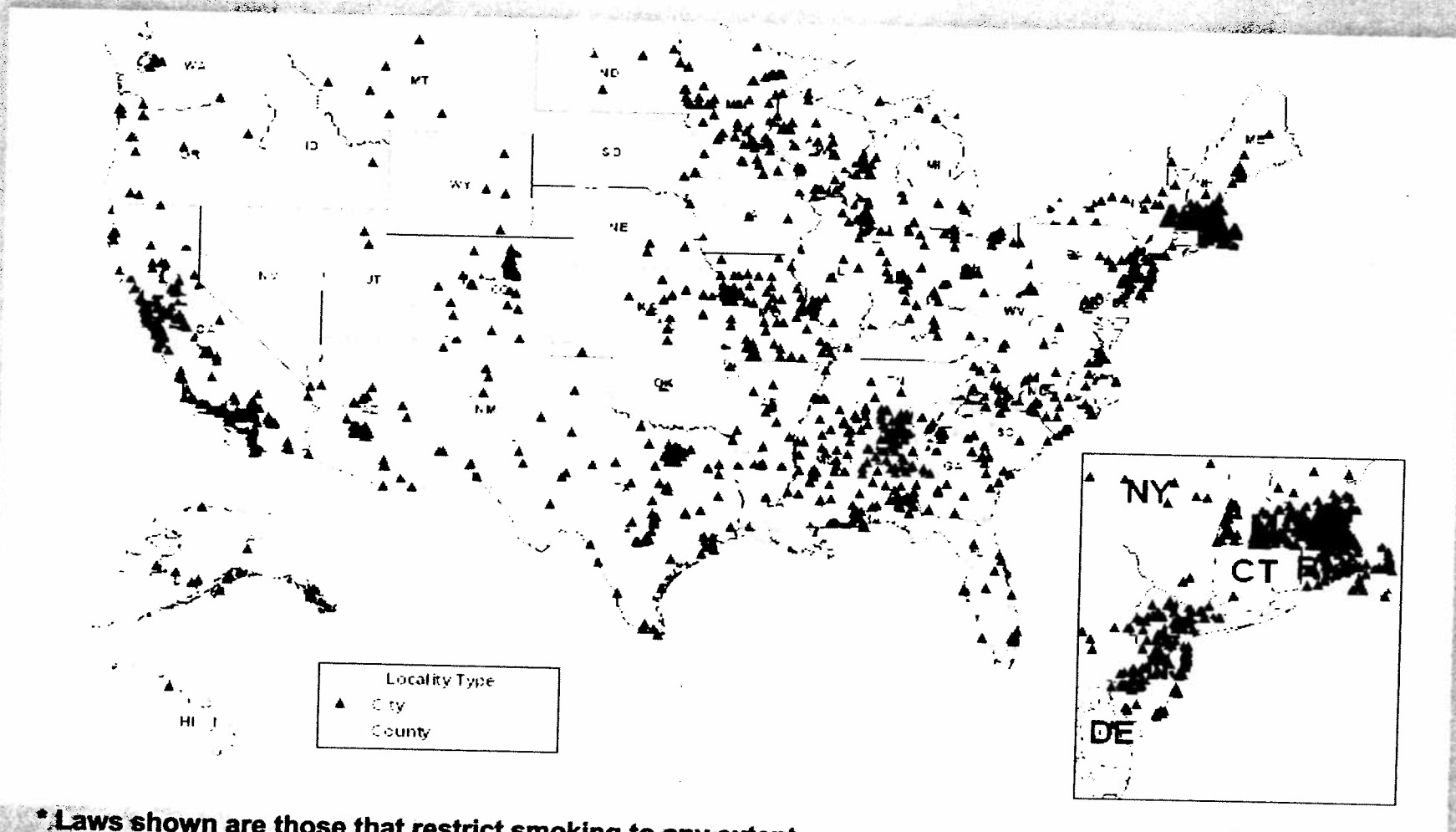
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# Project Scope

❑ Measure the economic impact of smoking ordinance on restaurant sales

❑ Analyze Houston and Dallas

# Rising Popularity of Smoking Control Ordinances



*Laws shown are those that restrict smoking to any extent.
Note: some laws shown are not yet in effect.
*Source: ANR Foundation, Local Tobacco Control Ordinance Database.*

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# Texas Municipal Smoking Control Ordinances

| Setting | No Coverage | | Limited | | Mixed | | Moderate | | 100% Smoke-free | | All Restricted | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | # | % | # | % | # | % | # | % | # | % | # | % |
| Municipal Worksites | 18 | 7 | 98 | 41 | 4 | 2 | 9 | 4 | 112 | 46 | 223 | 93 |
| Private Sector Worksites | 141 | 59 | 69 | 29 | 6 | 2 | 10 | 4 | 15 | 6 | 100 | 41 |
| Restaurants | 108 | 45 | 87 | 36 | 19 | 8 | 8 | 3 | 19 | 8 | 133 | 55 |
| Bars– In Restaurants | 183 | 76 | 33 | 14 | 10 | 4 | 5 | 2 | 10 | 4 | 58 | 24 |
| Bars– Not in Restaurants | 195 | 81 | 31 | 13 | 8 | 3 | 2 | 1 | 5 | 2 | 46 | 19 |

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| Municipality | Municipal Worksite | Private Worksite | Restaurant | Bar – Not in Restaurant | Bar – in Restaurant | Population | Minority % | County | Passage Date |
|---|---|---|---|---|---|---|---|---|---|
| Houston | 2 | 2 | 2 | 2 | 2 | 1,953,631 | 69.19 | Harris | 3/9/2005 |
| Dallas | 5 | 2 | 5 | 2 | 5 | 1,188,580 | 65.44 | Dallas | 1/22/2003 |
| San Antonio | 5 | 5 | 2 | 2 | 2 | 1,144,646 | 68.17 | Bexar | 8/7/2003 |
| Austin | 5 | 5 | 5 | 5 | 5 | 656,562 | 47.06 | Travis | 3/3/2005 |
| El Paso | 5 | 5 | 5 | 5 | 5 | 563,662 | 81.65 | El Paso | 1/2/2002 |
| Fort Worth | 5 | 3 | 3 | 2 | 2 | 534,694 | 54.19 | Tarrant | 5/20/1997 |
| Arlington | 3 | 3 | 2 | 3 | 3 | 332,969 | 40.36 | Tarrant | 10/11/2005 |
| Corpus Christi | 2 | 2 | 5 | 1 | 1 | 277,454 | 61.47 | Nueces | 1/11/2005 |
| Plano | 1 | 1 | 3 | 3 | 3 | 222,030 | 27.24 | Collin | 8/28/1995 |
| Garland | 5 | 1 | 3 | 1 | 1 | 215,768 | 46.71 | Dallas | 2/21/2006 |
| Lubbock | 4 | 4 | 4 | 1 | 1 | 199,564 | 38.70 | Lubbock | 7/12/2001 |
| Irving | 2 | 2 | 3 | 1 | 2 | 191,615 | 51.75 | Dallas | 7/17/1997 |
| Laredo | 5 | 5 | 5 | 5 | 5 | 176,576 | 94.96 | Webb | 4/3/2006 |
| Amarillo | 1 | 1 | 2 | 1 | 2 | 173,627 | 31.57 | Potter | 9/19/1989 |
| Pasadena | 5 | 1 | 1 | 1 | 1 | 141,674 | 52.76 | Harris | 2/19/1996 |
| Brownsville | 2 | 2 | 2 | 1 | 1 | 139,722 | 92.25 | Cameron | 1/31/1989 |
| Grand Prairie | 1 | 2 | 2 | 2 | 1 | 127,427 | 52.82 | Dallas | 2/4/1986 |
| Mesquite | 2 | 1 | 2 | 1 | 1 | 124,523 | 34.64 | Dallas | 1/1/1999 |
| Abilene | 2 | 2 | 2 | 1 | 1 | 115,930 | 31.24 | Taylor | 4/23/1987 |
| Beaumont | 5 | 5 | 5 | 5 | 5 | 113,866 | 57.32 | Jefferson | 4/25/2006 |

*Note: 100% Smoke-free (5) - No smoking allowed in a particular setting; Moderate (4) - Either no smoking allowed OR designated smoking areas are allowed if separately ventilated; Mixed (3) - Either no smoking is allowed OR designated smoking areas are allowed if separately ventilated, but coverage is partial due to exceptions, ambiguities, or legal issues; Limited (2) - Designated smoking areas allowed or required; No Coverage (1) - No restrictions on smoking. A setting not specifically indicated is scored as "No Coverage."

Source: Texas Smoke-Free Ordinance Database, University of Houston Health Network for Evaluation and Training Systems.

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# Prior Impact Studies

❑ **Results tend to correlate with funding sources**
- Public Health vs Restaurant & Tobacco Industries

❑ **Public Health sponsored studies**
- Analysis of aggregate restaurant sales
- Show no impact

❑ **Restaurant & Tobacco Industries**
- Analysis of disaggregated restaurant sales
- Show that some establishments negatively impacted

❑ **Not necessarily conflicting results**
- Differential effects on establishment but no effect in aggregate

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# Prior Impact Studies (cont.)

| Locality(ies) Studied (Report Date) | Author | Affiliation / Sponsor | Methodology | Results / Conclusions |
|---|---|---|---|---|
| *Texas Cities:* | | | | |
| West Lake Hills, (1995) | Huang, P<br>Tobias, S<br>Kohout, S<br>Harris, M<br>Saterwhite, D<br>Simpson, D<br>Winn, L<br>Foehner, J<br>Pedro, L | Centers for Disease Control | Used linear regression model to estimate the effect of smoking ordinance on aggregate restaurant sales, controlling for seasonal and temporal economic trends. | Total sales of the restaurants did not decrease after implementation of the ordinance. |
| Arlington<br>Austin<br>Plano<br>Wichita Falls<br>(2000) | Hayslett, J<br>Huang, P | Texas Department of Health | Used linear regression model to estimate the effect of smoking ordinance on aggregate restaurant sales, controlling for seasonal and temporal economic trends. | Total sales showed no evidence of decreasing with the implementation of clean indoor air ordinances in any of the four cities reviewed. |
| El Paso (2004) | Huang, P<br>McCusker, M | Centers for Disease Control | Used linear regression model to estimate the effect of smoking ordinance on aggregate restaurant sales and mixed-beverage sales tax receipts, controlling for seasonal and temporal economic trends. | Total sales and mixed beverage sales were not affected by the smoking ban. |
| Dallas (2004) | Clower, T L<br>Weinstein, B L | Greater Dallas Restaurant Association | Evaluated alcoholic beverage sales data, reviewed a survey of the Greater Dallas Restaurant Association membership and analyzed information obtained from press reports. | Alcohol sales in Dallas eating and drinking establishments fell between 2002 and 2003, while sales in surrounding areas increased. Self-reported survey data found that restaurant sales declined. |

# Methodology

❑ Analyzed both taxable sales and mixed beverage sales

❑ Studied historical performance of restaurant sectors in both markets

❑ Used regression analysis and adaptive forecasting to estimate impact of ordinances

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# Data Sources

- **Taxable Sales from Comptroller**
  - Aggregate, Eating Places, Eating and Drinking Places
- **Mixed Beverage Sales from Comptroller**
  - Full-Service Restaurants and Drinking Places
- **Consumer Price Index from BLS**
- **Business Cycle Index from Federal Reserve of Dallas**
- **Constructed variables to control for seasonality**
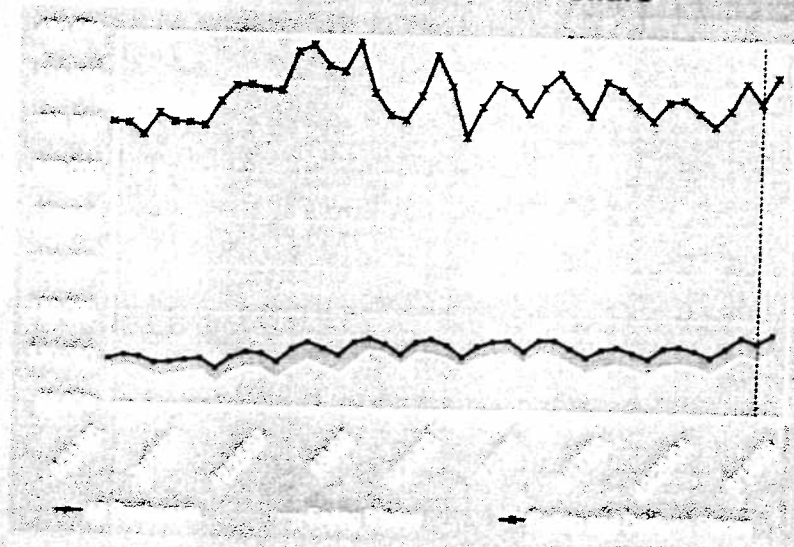- **Constructed variable to represent ordinance**

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# Historical Performance
# Restaurant Sales

**Dallas Restaurant Sales per Outlet
By Restaurant Type
In Constant 2006 Dollars**
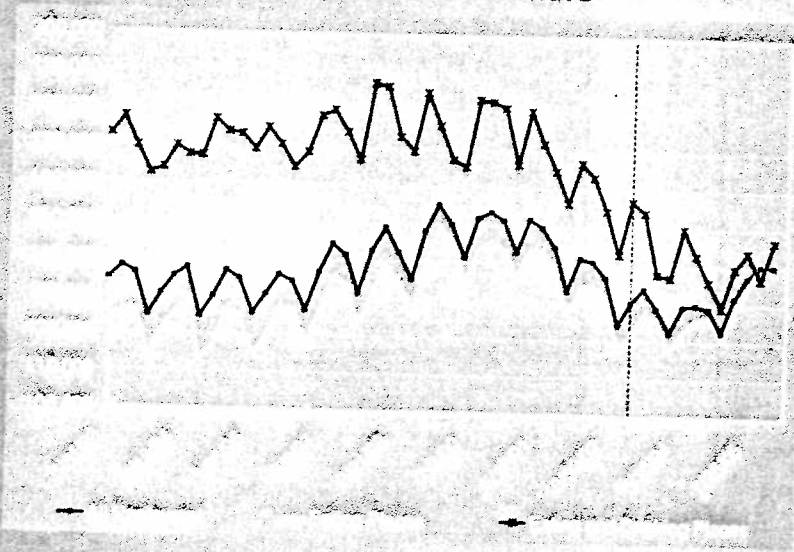
**Houston Restaurant Sales per Outlet
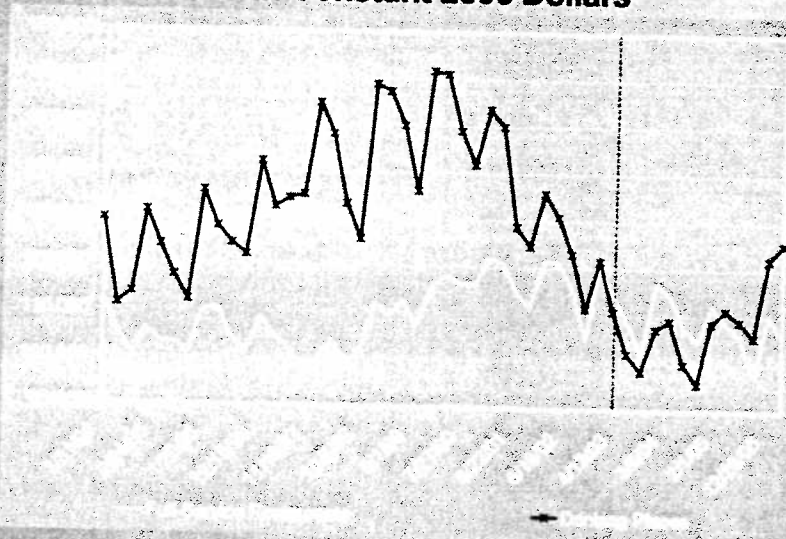By Restaurant Type
In Constant 2006 Dollars**



- ☐ 1st and 2nd quarter figures higher than 3rd and 4th quarter
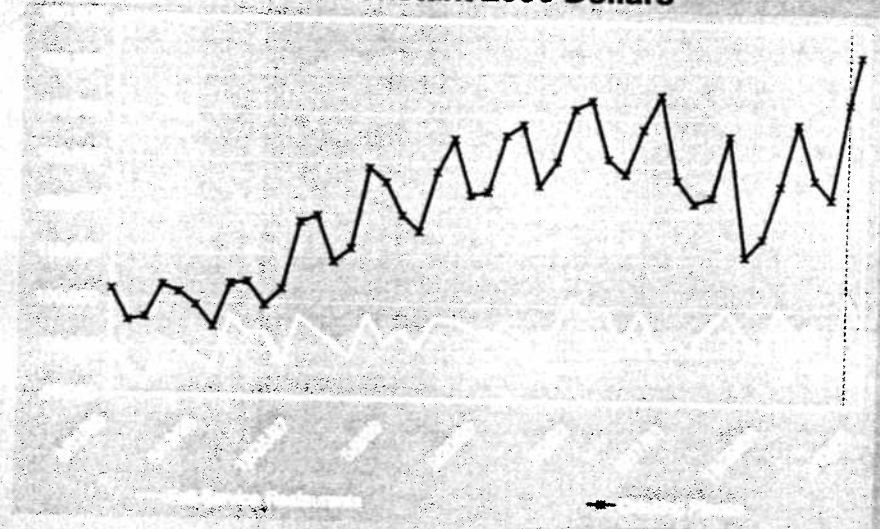- ☐ Dallas restaurants more sensitive to economic recession

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# Historical Performance
# Mixed Beverage Sales

**Dallas Mixed Beverage Sales per Outlet
By Outlet Type
in Constant 2006 Dollars**

**Houston Mixed Beverage Sales per Outlet
By Outlet Type
in Constant 2006 Dollars**

- ☐ 4th and 1st quarter sales higher than 2nd and 3rd quarter
- ☐ Dallas bars more sensitive to economic recession

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# Dallas
# Trend Analysis Results

| | Constant | Time | Q1 | Q2 | Q3 | BCI | Ord |
|---|---|---|---|---|---|---|---|
| **Restaurant Sales** | | | | | | | |
| All Restaurants | 66,823 | -326 | 3,971 | 5,801 | 4,514 | 295 | 1,740 |
| | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.146 |
| | Adj. $R^2$ = 0.838 | | | | | | |
| Eating Places | 99,897 | -508 | 6,515 | 11,229 | 9,984 | 576 | 5,425 |
| (SIC 5812) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.064 |
| | Adj. $R^2$ = 0.808 | | | | | | |
| Eating and Drinking Places | 246,662 | -1,284 | 11,144 | 10,064 | 3,525 | 646 | -2,039 |
| (SIC 5816, 5817) | 0.000 | 0.000 | 0.000 | 0.000 | 0.044 | 0.000 | 0.215 |
| | Adj. $R^2$ = 0.910 | | | | | | |
| **Mixed Beverage Sales** | | | | | | | |
| Full-Service Restaurants | 57,647 | 286 | -1,392 | -4,320 | -8,910 | 64 | -9,061 |
| (NAICS 722110) | 0.000 | 0.081 | 0.267 | 0.000 | 0.000 | 0.534 | 0.013 |
| | Adj. $R^2$ = 0.529 | | | | | | |
| Drinking Places | 182,805 | -1,630 | -3,093 | -13,241 | -17,918 | 1,177 | 5,864 |
| (NAICS 722410) | 0.000 | 0.000 | 0.092 | 0.000 | 0.000 | 0.000 | 0.080 |
| | Adj. $R^2$ = 0.908 | | | | | | |

# Dallas
# Impact of Smoking Ordinance

❑ **Restaurant Sales**

- No significant effect on aggregate restaurant sales
- No significant effect on Eating Places
- No significant effect on Eating and Drinking Places

❑ **Mixed Beverage Sales**

- No significant effect on Drinking Places
- Significant effect on Full-Service Restaurants

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# Houston
# Trend Analysis

**Houston Restaurant Sales per Outlet in 2006 Constant Dollars**
**All Restaurants (SIC 5812, 5816, 5817)**
**Holt-Winters Forecast**
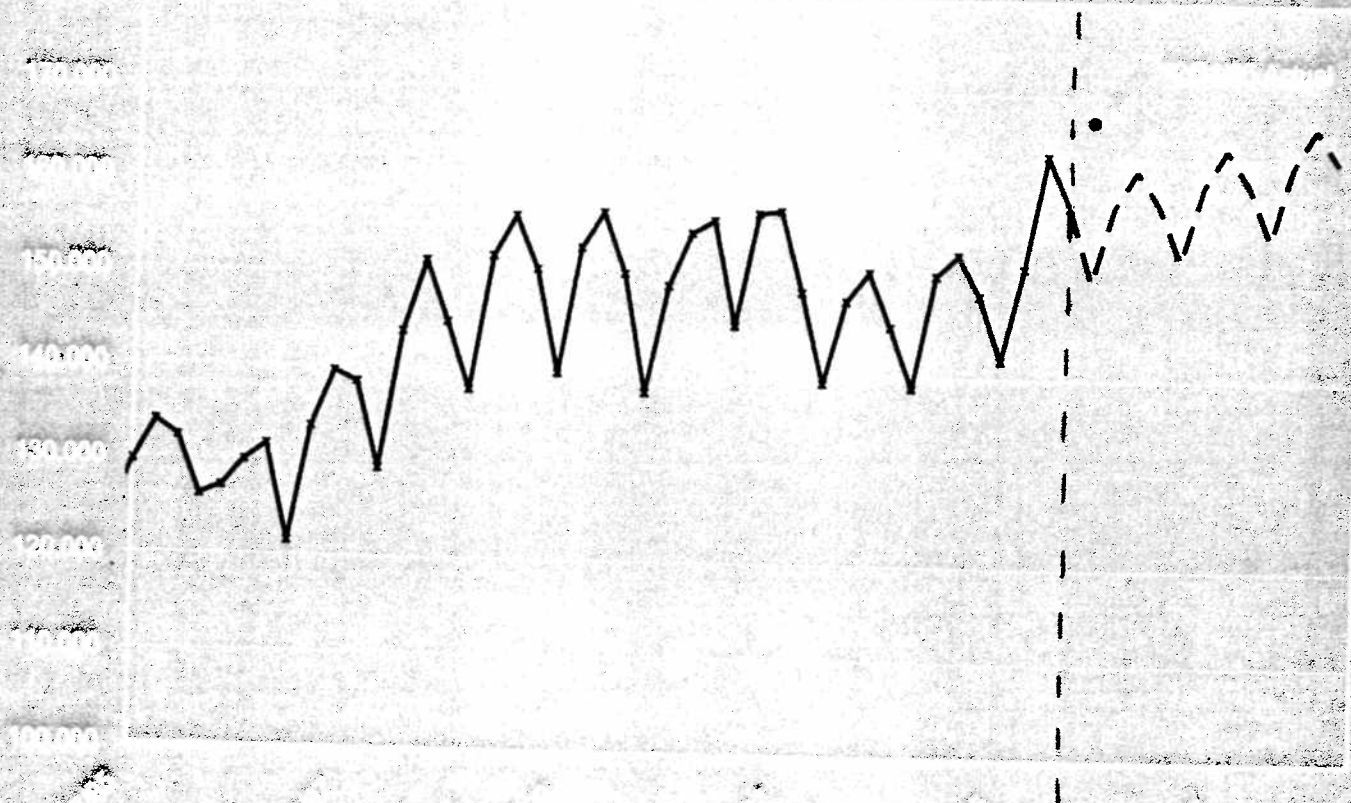
# Houston
# Trend Analysis Results

| | Constant | Time | Q1 | Q2 | Q3 | BCI | Ord |
|---|---|---|---|---|---|---|---|
| *Mixed Beverage Sales* | | | | | | | |
| Full-Service Restaurants | 90,750 | -155 | -2,995 | -4,141 | -8,207 | 167 | 1,300 |
| (NAICS 722110) | 0.000 | 0.157 | 0.001 | 0.000 | 0.000 | 0.016 | 0.233 |
| | Adj. $R^2$ = 0.718 | | | | | | |
| Drinking Places | 108,985 | -1,299 | 3,726 | -8,567 | -9,892 | 1,183 | 3,250 |
| (NAICS 722410) | 0.000 | 0.001 | 0.063 | 0.000 | 0.000 | 0.000 | 0.282 |
| | Adj. $R^2$ = 0.900 | | | | | | |

## ❑ Mixed Beverage Sales

- No significant effect on Full-Service Restaurants
- No significant effect on Drinking Places

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# Conclusions

- ❏ No adverse effects on restaurant sales in aggregate or by restaurant type
- ❏ Negative impact on Dallas Full-Service Restaurants' mixed beverage sales
  - ▪ Trend not replicated in Houston
- ❏ Non-uniform effects on different types of restaurants
  - ▪ Generally insignificant

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# Questions?

# Regression Model

$$Y = \beta_0 + \beta_1(Tm) + \beta_2(Q1) + \beta_3(Q2) + \beta_4(Q3) + \beta_5(BCI) + \beta_6(Ord) + \varepsilon$$

where:

Y = Local taxable restaurant sales per outlet in constant 2006 dollars, or local gross mixed beverage sales per outlet in constant 2006 dollars.

Tm = the time period in which the observation was taken.

Q1 = 1 if the observation was in the first quarter and 0 if otherwise.

Q2 = 1 if the observation was in the second quarter and 0 if otherwise.

Q3 = 1 if the observation was in the third quarter and 0 if otherwise.

BCI = Business Cycle Index for the appropriate MSA and time period.

Ord = 1 if the smoking ordinance was in effect and 0 if otherwise.

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